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**WO 94/18905 A1 US 5188616 A US 4521237 A**  
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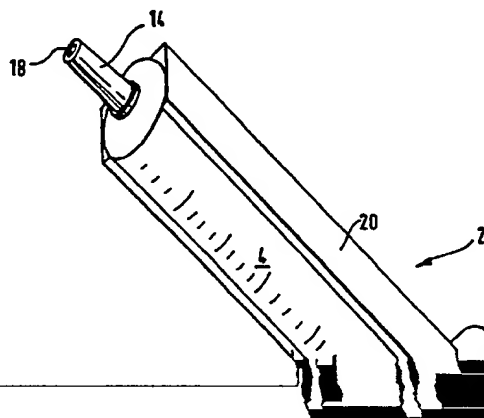
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INT CL<sup>6</sup> **A61C 5/06 19/10 , A61M 3/00 5/00 5/24 5/28**  
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(54) **A colour coded hypodermic syringe**

(57) Hypodermic syringe 2 is integrally colour coded to correspond with one of eleven different colours assigned to the drug classes being injected. The syringe 2 may be disposable and manufactured from transparent plastic. Colour coding may be provided on the plunger 16 or on the body 4 and is introduced into the material from which the syringe 2 is made, preferably during moulding. Medicament containers and syringe outer wrapping (both not shown) may also be correspondingly colour coded.

The syringe 2 may also have one or two matt writing surfaces 20 to record medicament or patient details.

The above modifications reduce injection errors and unnecessary disposal of syringes due to uncertainty about contents.



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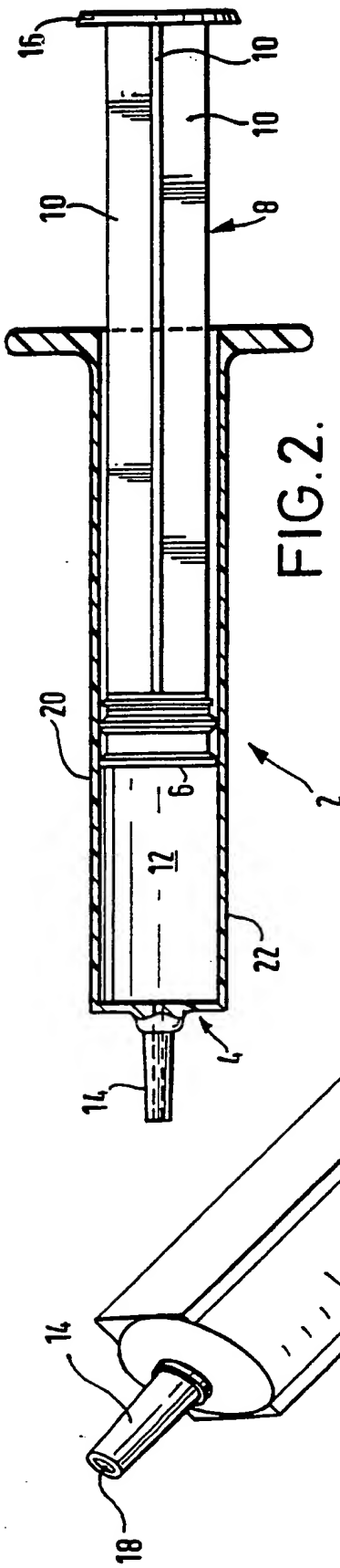


FIG. 2.

FIG. 1.

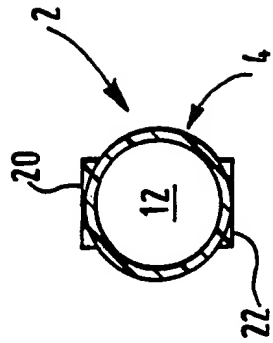


FIG. 3.

A COLOUR CODED HYPODERMIC SYRINGE

This invention relates to a hypodermic syringe.

Hypodermic syringes, and especially disposable hypodermic syringes, are widely used for injecting liquids such for example as drugs into patients. Two problems may currently occur in the use of known hypodermic syringes. The first problem is that a nurse or a doctor may inject an incorrect drug into a patient, due to the liquid in the hypodermic syringe being thought to be something other than what it is. Fatalities of patients in hospitals due to the incorrect injection of drugs are a too frequent occurrence. The second problem is that of wastage of hypodermic syringes and/or the drugs or other medicaments in the hypodermic syringes. More specifically, pharmacists may be distracted during the process of filling a plurality of hypodermic syringes with either different medicaments or the same type of medicament but of differing strengths. By the very nature of medicine, emergencies frequently occur and thus there are many possible distractions for a person filling the hypodermic syringes. If the person is not sure as to the precise content of one or more hypodermic syringes,

then the person may be forced to guess, resulting in an unacceptable risk to human life, or is forced to throw away hypodermic syringes, resulting in a wastage of the hypodermic syringes and also in a wastage of the medicament in the hypodermic syringes.

It is an aim of the present invention to obviate or reduce the above mentioned problems.

Accordingly, in one non-limiting embodiment of the present invention there is provided a hypodermic syringe which is colour coded by colour coding means formed as an integral part of the hypodermic syringe.

The colour coding means permits the positive identification of a hypodermic syringe for a given liquid such for example as a drug or other medicament that is to be placed in, or that is actually in, the hypodermic syringe. Thus a person such as a pharmacist filling a hypodermic syringe with a liquid for injection into a patient will use a hypodermic syringe of the appropriate colour for the drug class of liquid being used. The colour coding means is able to help to eliminate the above mentioned too frequent occurrence of a patient being injected with an incorrect drug, often with fatal consequences, and also the above mentioned too frequent occurrence of a person becoming unsure of what a syringe contains and throwing away the contents of the syringe and also sometimes the syringe.

The colour coding means is able to identify the actual contents of a hypodermic syringe for end users such for example as nurses, paramedics, pharmacists and doctors. Such end users can see at a glance and in a relatively full-proof manner what type of liquid should be in the hypodermic syringe due to the colour coding. This helps to prevent the persons filling a hypodermic syringe with an incorrect liquid and then injecting this incorrect liquid into a patient.

Patient safety is further ensured because the colour coding means is formed as an integral part of the hypodermic syringe. Thus the colour coding means will usually be formed as part of the hypodermic syringe at the time of its manufacture and there is no possibility of someone forgetting to colour code the hypodermic syringe, for example as might be the case if the colour coding means were a simple adhesive label. Also, because the colour coding means forms an integral part of the hypodermic syringe, it cannot come off or otherwise get mislaid during use of the hypodermic syringe, again as might be the case with a simple sticky label.

A yet further advantage of the hypodermic syringe of the present invention is that it may be reused if necessary. The hypodermic syringe will not be such that its needle is reused but the remainder of

the hypodermic syringe can be reused in comparative safety when necessary, for example in extremely poor countries where the required number of disposable hypodermic syringes is just not available and large numbers of patients require immediate attention. In such circumstances, the colour coding means helps to ensure the hypodermic syringe is not refilled with a different type of liquid, for example a drug that could kill instead of cure.

The hypodermic syringe of the present invention is preferably a disposable hypodermic syringe.

The hypodermic syringe is preferably one in which the colour coding means is a coloured part of the hypodermic syringe with the colour having been introduced into the material from which the hypodermic syringe is made. Usually the hypodermic syringe will be made of a transparent material so that the colour coding means can then be a coloured part of the hypodermic syringe which will contrast well with the otherwise transparent colour of the hypodermic syringe. The hypodermic syringe will usually be made by moulding an appropriate plastics material. The hypodermic syringe of the present invention can be made using current techniques for producing hypodermic syringes, with the added difference that the hypodermic syringe has to be provided with the colour coding means.

The colour coding means may be provided on a part of the hypodermic syringe that will not be in direct contact with a liquid to be dispensed from the hypodermic syringe. This helps to avoid any possibility of various different liquids for use in various different hypodermic syringes possibly being such that one of them might leach colour from the colour coding means.

The hypodermic syringe may be one which comprises a body portion, a piston working in the body portion, and a plunger for moving the piston.

The colour coding means may be provided as an integral part of the plunger. Alternatively or in addition, the colour coding means may be provided as an integral part of the body portion.

The present invention may be such that hypodermic syringes are produced with up to eleven different types of colours for the colour coding means. Thus each syringe may have one of eleven different colours with each colour being confined to a specific end use for the contents of the hypodermic syringes. Eleven different colours have been chosen because this represents the maximum number of colours that is easily distinguishable by the human eye.

The hypodermic syringe may include a first data receiving portion for receiving the name of the

specific liquid to be contained in the hypodermic syringe or actually in the hypodermic syringe.

The first data receiving portion is preferably a first flat portion of the hypodermic syringe for enabling the name and other details of the specific liquid to be written on the first flat portion. The concentration and other pertinent details of the specific liquid may also be written if desired. Preferably the first flat portion of the hypodermic syringe is provided with a matt writing surface.

The hypodermic syringe may include a second data receiving portion for receiving the name of a patient to receive the injection of the drug from the hypodermic syringe.

The second data receiving portion may be constructed similarly as the first data receiving portion. Thus, for example, the second data receiving portion is preferably a second flat portion of the hypodermic syringe which is able to be written on. The second flat portion of the hypodermic syringe is preferably provided with a matt writing surface. The information with regard to the name of the specific liquid and/or the concentration of the liquid, and the information with regard to the name of the patient can be written on the hypodermic syringe just prior to or at



the time of filling the hypodermic syringe with the appropriate liquid.

The writing on the hypodermic syringe of the patient's name is especially advantageous in ensuring that the hypodermic syringe is filled with the correct liquid in the required concentration and volume and that this liquid is injected into the correct patient. Persons such as nurses, doctors or anaesthetists work in hospitals under considerable pressure. There is always a risk that they may wrongly identify a patient or a drug and may thus inject the wrong patient with a correctly identified drug.

Apart from the provision of the colour coding means, and the first and the second data receiving portions when desired, the hypodermic syringe may be of known design and manufacture. The hypodermic syringes of the present invention may be produced in various sizes, for example from 0.5cc to 250cc. The hypodermic syringes of the present invention may also be produced in various shapes, for example circular and oval cross sectional shapes.

The present invention also provides the combination of at least two of the hypodermic syringes, the combination being such that one of the hypodermic syringes is differently colour coded to the other of the hypodermic syringes.

The present invention also provides a method of colour coding a hypodermic syringe, which method comprises providing the hypodermic syringe with colour coding means formed as an integral part of the hypodermic syringe.

The method of the present invention may be one in which the colour coding means is provided as a portion of the hypodermic syringe during moulding of that portion of the hypodermic syringe. The portion of the hypodermic syringe may be the above mentioned body portion, or parts thereof, and/or the plunger.

Apart from the provision of the colour coding means, the hypodermic syringe is preferably manufactured from a transparent plastics material. The use of transparent plastics materials is preferred in order to enable a liquid in the hypodermic syringe easily to be seen. If desired, print and numbers on the hypodermic syringe may also be coloured in the same colour as the plunger.

The present invention still further provides a method of colour coding at least two hypodermic syringes, which method comprises providing the hypodermic syringes with colour coding means formed as an integral part of the hypodermic syringes, and which method is such that one of the hypodermic syringes is

differently colour coded to the other of the hypodermic syringes.

If desired, the hypodermic syringe may be provided in combination with a chart for completion by authorised personnel, for example in hospitals or clinics, such that the chart allocates different colours to different types of liquid to be used in the different hypodermic syringes, thereby providing a dispensing system.

An embodiment of the invention will now be described solely by way of example and with reference to the accompanying drawings in which:

Figure 1 is a perspective view of a hypodermic syringe;

Figure 2 is a longitudinal section through the hypodermic syringe shown in Figure 1; and

Figure 3 is a cross section through the hypodermic syringe shown in Figure 1.

Referring to the drawings, there is shown a hypodermic syringe 2 comprising a body portion 4, a piston 6 working in the body portion 4, and a plunger 8 for moving the piston 6. The plunger 8 may have four wings 10 as best seen in Figure 1. These wings 10 are not normally in contact with a liquid in a chamber 12 in the hypodermic syringe 2 because the liquid is sucked into the chamber 12 through a nozzle 14 when the piston

6 is moved to the right as shown in Figure 2 by pulling on a gripping portion 16 of the plunger 8. The chamber 12 will be marked to indicate the volume of liquid inside. Such markings, numbers and letters may be in a colour to match the colour of the plunger. The outside of the nozzle 14 may also be of the same colour as the plunger 8 and the graphics on the chamber 12. When it is desired to inject the liquid from the chamber 12 into a patient (not shown) the plunger 8 is then pushed into the body portion 4 to eject the liquid from the chamber 12 out through the nozzle 14 and into the patient via a needle (not shown) located in a bore 18 of the nozzle 14. The wings 10 and the gripping portion 16 forming the plunger 8 are thus provided in a single colour to provide colour coding means formed as an integral part of the hypodermic syringe 2. The colour coding means can be used as described above to provide a good degree of certainty with regard to a liquid being injected into a patient, and also to provide a substantial reduction on the amount of wastage caused by persons filling hypodermic syringes suddenly becoming unsure as to what they have filled and with what, and then throwing away the liquid contents of the hypodermic syringe and also possibly the hypodermic syringe itself.

The hypodermic syringe 2 is such that the body portion 4 is provided with a first data receiving

portion in the form of a first flat portion 20, and with a second data receiving portion in the form of a second flat portion 22. As can be seen, the first and second flat portions 20, 22 are formed as part of the body portion 4. The first and the second flat portions 20, 22 each have a matt writing surface for enabling the first and the second flat portions 20, 22 to be written on. The first flat portion 20 is for receiving the name of the specific liquid to be contained in the hypodermic syringe 2 and, if desired, other pertinent details of the liquid. The second flat portion 22 is for receiving the name and/or other identifying details of the patient to receive an injection from the hypodermic syringe 2.

It will be appreciated that the first and the second flat portions 20, 22 provide a further degree of safety over and above the use of the colour coding means. The colour coding means identifies the broad type of liquid that is to be used in the hypodermic syringe 2. The first flat portion 20 is able to give the name of the specific liquid in the hypodermic syringe 2 and, if desired, give the amount of the liquid in the hypodermic syringe 2 and the prescription reference. The second flat portion 20 is able to be used for the name or reference number of the actual patient who is to receive the injection from the hypodermic syringe 2, thereby helping to avoid the very

real possibility that has hitherto existed of a person such as a doctor or a nurse injecting the wrong patient due to confusion as to the patient's identity.

The hypodermic syringe of the present invention enables the preparation of liquid medications with far better certainty of the medicament in the syringes being the correct medication. Much of the current wastage of drugs and other liquid medications by pharmacists in the pharmacies of large hospitals may be avoided. The hypodermic syringe of the present invention is also useful in areas where there are limited resources such for example as where skeletal medical teams are working in developing rural areas, or are working in third world conditions in urban areas. In addition to safety conditions, substantial cost savings can be effected in the avoidance of the disposal of medicaments that cannot be identified with certainty and/or the disposal of syringes after a single use in, for example, under developed areas where the reuse of a disposable syringe under good conditions of use security is vastly preferable to not having a syringe at all and watching patients die.

It is to be appreciated that the embodiment of the invention described above with reference to the accompanying drawings has been given by way of example only and that modifications may be effected. Thus, for

example, the hypodermic syringes of the present invention may be produced to appear different from that shown in the drawings. The hypodermic syringes can be used with a wide variety of liquids including antibiotics, anaesthetics, intraethical solutions, bone marrow transplant medications, and allergy testing and desensitising medications. The hypodermic syringes will usually be used to inject drugs into patients who are people. However, animals may also be injected with the same safety and security if desired.

In order to provide further safety and security, containers from which liquid medicaments are obtained in bulk and/or the syringe outer wrapping may be colour coded. The colour coding is preferably by integral colour coding means formed as an integral part of the containers and/or the syringe outer wrapping, but it may also be in the form of a tag or an adhesive label in situations where it is impractical to manufacture the containers and/or the syringe outer wrapping in a variety of colours.

If desired, the hypodermic syringe may be provided in a pack, for example a bubble pack, of the same colour as the colour coding means of the hypodermic syringe. This pack may be provided with one or more coloured strips or labels which are of the same colour as the colour coding means and which are removable, for

example for sticking on a drug container and/or for sticking on a patient's record card, in order to provide further certainty of knowledge of a drug to be injected into a patient.



**CLAIMS**

1. A hypodermic syringe which is colour coded by colour coding means formed as an integral part of the hypodermic syringe.
2. A hypodermic syringe according to claim 1 and which is a disposable hypodermic syringe.
3. A hypodermic syringe according to claim 1 or claim 2 in which the colour coding means is a coloured part of the hypodermic syringe with the colour having been introduced into the material from which the hypodermic syringe is made.
4. A hypodermic syringe according to any one of the preceding claims in which the colour coding means is provided on a part of the hypodermic syringe that will not be in direct contact with a liquid to be dispensed from the hypodermic syringe.
5. A hypodermic syringe according to any one of the preceding claims and comprising a body portion, a piston working in the body portion, and a plunger for moving the piston.

6. A hypodermic syringe according to claim 5 in which the colour coding means is provided as an integral part of the plunger.

7. A hypodermic syringe according to claim 5 or claim 6 in which the colour coding means is provided as an integral part of the body portion.

8. A hypodermic syringe according to any one of the preceding claims and including a first data receiving portion for receiving the name of the specific liquid to be contained in the hypodermic syringe, or actually in the hypodermic syringe.

9. A hypodermic syringe according to claim 8 in which the first data receiving portion is a first flat portion of the hypodermic syringe.

10. A hypodermic syringe according to claim 9 in which the first flat portion of the hypodermic syringe is provided with a matt writing surface.

11. A hypodermic syringe according to any one of the preceding claims and including a second data receiving portion for receiving the name of a patient to receive an injection from the hypodermic syringe.

12. A hypodermic syringe according to claim 11 in which the second data receiving portion is a second flat portion of the hypodermic syringe.

13. A hypodermic syringe according to claim 12 in which the second flat portion of the hypodermic syringe is provided with a matt writing surface.

14. A hypodermic syringe substantially as herein described with reference to the accompanying drawings.

15. The combination of at least two of the hypodermic syringes as claimed in any one of the preceding claims, the combination being such that one of the hypodermic syringes is differently colour coded to the other of the hypodermic syringes.

16. A method of colour coding a hypodermic syringe, which method comprises providing the hypodermic syringe with colour coding means formed as an integral part of the hypodermic syringe.

17. A method according to claim 16 in which the colour coding means is provided as a portion of the

hypodermic syringe during moulding of that portion of the hypodermic syringe.

18. A method of colour coding a hypodermic syringe, substantially as herein described.

19. A method of colour coding at least two hypodermic syringes, which method comprises providing the hypodermic syringes with colour coding means formed as an integral part of the hypodermic syringes, and which method is such that one of the hypodermic syringes is differently colour coded to the other of the hypodermic syringes.

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**Patents Act 1977**  
**Examiner's report to the Comptroller under Section 17**  
**(The Search report)**

**Application number**  
**GB 9400676.4**

**Relevant Technical Fields**

- (i) UK Cl (Ed.N)     A5R RCCA, RCCB, RCQX, RGD  
(ii) Int Cl (Ed.6)     A61M 3/00, 5/00, 5/24, 5/28, 5/31, 5/315,  
A61C 5/06, 19/10

**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

**Search Examiner**  
**MR S J PILING**

**Date of completion of Search**  
**21 APRIL 1995**

**Documents considered relevant**  
**following a search in respect of**  
**Claims :-**  
**1 TO 19**

**Categories of documents**

- |  |   |
|--|---|
| <p><b>X:</b> Document indicating lack of novelty or of inventive step.</p> <p><b>Y:</b> Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p><b>A:</b> Document indicating technological background and/or state of the art.</p> | <p><b>P:</b> Document published on or after the declared priority date but before the filing date of the present application.</p> <p><b>E:</b> Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p><b>&amp;:</b> Member of the same patent family; corresponding document.</p> |
|--|---|

Category	Identity of document and relevant passages		Relevant to claim(s)
E,X	WO 94/18905 A1	(ULTRADENT) page 3 lines 15 to 21, page 6 line 24 to page 7 line 28 and Figures 1 to 5	1 to 7, 15, 16, 19
X,Y	US 5188616	(NADAL) column 2 line 57 to column 3 line 5, column 5 lines 38 to 61 and Figure 2	X: 1, 2, 3, 5, 6, 7, 16, 17 Y: 8 to 13
X,Y	US 4521237	(LOGOTHETIS) column 1 lines 5 to 6, column 4 lines 8 to 33, Figures 6 and 7	X: 1,2, 4, 5, 15, 16, 19 Y: 8 to 13
Y	US 3885562	(LAMPKIN) column 1 line 63 to column 2 line 19 and Figure 1	8 to 13

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).